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## System for preventing the deformation of sails, such as jibs, which are mounted on reels

The present invention relates to a system designed to prevent the deformation of sails, particularly jibs, mounted on reels.

It is known that the jibs which are mounted on reels pose a basic problem, when they are being used with a view to reducing the area of the sail, particularly when this sail is half rolled up.

In such a case (see figure 1 of the attached drawings), the sail is rolled up more or less flat onto the cylinder of which the reel 10 is formed, and the fabric bunches up towards the center, the belly of the sail fabric then tending to accumulate in the remaining sail, forming a pocket 12. Furthermore, the deformation of the sail and the tension in the leeches and foot tend to cause the sail to wrinkle on its reel, and this has the effect of accentuating the pocket, deforming the sail still further.

Such deformations, aside from their disadvantage from 25 an esthetic standpoint, result in a loss of performance of the sail, the area of which has been reduced.

The problem that the present invention sets out to solve is of ensuring that, for a given strength of wind, the sail, the area of which has been reduced by rolling up, is adjusted in terms of area, as in a conventional reel solution, but also has the shape and deformation needed for the forces required by the pressure of the wind.

The solution to this problem is provided, according to the invention, by a system for preventing the deformation of sails, such as jibs in particular, which

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are mounted on reels, comprising means designed to fashion an additional volume in the central part of the reel, characterized in that the sail mounted on said reel is non-deformable in compression around the reel and parallel to its hoist side, and in that it is produced from a fabric comprising transverse and longitudinal fibers resistive to compression and local buckling, this fabric being incorporated between two films of fine fabric, the whole then being bonded.

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According to a preferred embodiment of the present invention, said films of fine fabric are films of ethylene glycol polyterephthalate.

According to another aspect of the invention, the means designed to fashion an additional volume in the central part of the reel consists of additional slats or additional fibers in the sail that is to be rolled up, and which form, when the sail is rolled up onto a cylindrical reel, said additional volume.

According to another embodiment of the present invention, the means designed to fashion an additional volume in the central part of the reel consists of a biconical reel, possibly reinforced for torsion.

According to yet another feature of the present invention, the reel is protected by a fairing forming an aerofoil, it being possible for this fairing to be cylindrical, conical or biconical. It may comprise, on its inside, a protruding part in the form of a spoiler which presses against the sail.

Other features and advantages of the present invention
35 will become apparent from the description given
hereinafter, with reference to the attached drawings
which illustrate entirely nonlimiting exemplary
embodiments thereof. In the drawings:

- figure 1 shows a schematic side elevation of a boat equipped with a reel and with a jib both of which are conventional;
- figure 2 is a view similar to figure 1 depicting the boat with a reel according to the invention;

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- figure 3 is a view similar to figure 1 illustrating an exemplary embodiment of a jib according to the invention;
- figure 4a is a part view, depicting, in plan, the
   fabric of a sail according to another exemplary embodiment;
  - figure 4b is a section through figure 4a on a vertical plane;
- figure 5 is a view similar to figure 1
   illustrating another exemplary embodiment of the invention;
  - figure 6 is a view similar to figure 1 illustrating yet another exemplary embodiment of the invention, and
- 20 figure 7 is a section on 7-7 of figure 6, on an enlarged scale.

As mentioned above, the invention provides means allowing the sail to be rendered non-deformable in compression around the reel and parallel to its hoist side.

According to the exemplary embodiment depicted figures 4a and 4b, the deformability of the sail is obtained by producing a fabric which comprises fibers 30 that are coarse enough and polymerized in such a way as to resist compression and local buckling. Such a fabric may be produced by incorporating between two films 17, of fine fabric, for example films of 35 glycol polyterephthalate, particularly of the type marketed under the trade name "Mylar", transverse and longitudinal fibers 18, 18' that are resistant to compression, the whole then being bonded. This then yields an anisotropic fabric resistant to compression and also improving the integrity of the sail.

According to the other exemplary embodiment illustrated by figure 3, this non-deformability is obtained by stitching slats such as 16 onto the sail, parallel to its hoist side, the slats being able to be rolled onto the reel.

The invention also provides means which are designed to fashion an additional volume in the central part of the 10 reel. Referring to figure 2, it can be seen that, in this exemplary embodiment of the system according to the invention, the conventional cylindrical replaced by a biconical reel 14 consisting of frustoconical parts, the vertices 15 of which are positioned at the head 15 and tack 13 respectively. This biconical reel is strengthened for torsion necessary. By virtue of this biconical reel, additional volume is obtained in the central part of 20 the reel.

In the exemplary embodiment illustrated by figure 5, use is made of a conventional cylindrical reel 19 and additional slats or additional fibers are provided in the central part of the sail that is to be rolled up, parallel to the hoist side thereof, so as to form, as the sail is rolled up, said additional volume and obtain additional local rigidity. This then yields a solution which is equivalent to that of the biconical reel 14 of figure 2.

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According another of to aspect the invention illustrated by figure 7, the reel denoted reference 20 is protected by a shaped fairing forming 35 aerofoil 22. This fairing may be made appropriate material such as metal, laminate, extruded plastic, for example. It may be cylindrical, conical or imitation conical or biconical. According invention, the fairing 22 comprises, on its inside, a

spoiler 23 designed so that the sail presses against it, which allows the sail to be orientated correctly when partially unrolled, as can be seen clearly in figure 7.

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Of course, the present invention is not restricted to the exemplary embodiments described and depicted hereinabove, but encompasses all variants thereof.